

Second Semester BSc Degree examination may 2019

Foundation Course Chemistry

CH1221 – Methodology and Perspectives of Sciences and General Informatics

(2013-2016 Admissions) Max Marks :80

| Q.No | Section A<br>Answer All questions, Each question carries 1 mark  | Marks |
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| 1    | What is a scientific law?<br>Condensed description of observations   | 1     |
| 2    | What is meant by the term scientific observation<br>Precised and systematic observation  |       |
| 3    | How do scientific creativity originate<br>From imagination/ creativity and intelligence  |       |
| 4    | Who introduced atomic theory of matter<br>John Dalton  |       |
| 5    | Who synthesized first organic compound<br>Friedrich Wohler   |       |
| 6    | Define information<br>Collected, organized and analysed data   |       |
| 7    | What does INFLIBNET stands for<br>National network interconnecting various libraries and information centres.  |       |
| 8    | What is the difference between median and mean<br>Mean = $x_1+x_2 +x_3+\dots/n$ , where $x_1,x_2,x_3 \dots$ are the entries<br>Median : The middle most value in the data set when the entries are arranged in ascending or descending order |       |
| 9    | What do you mean by plagiarism   |       |

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|    | Deliberate representation of another's words, thoughts or ideas as ones own   |   |
| 10 | Represent the SMILES notation of benzene.<br>c1ccccc1   |   |
|    | <b>Section B</b><br><b>Answer any eight questions Each question carries 2 marks</b>   |   |
| 11 | Give a brief explanation of knowledge<br>Set of organized statement of findings/ facts/ideas. Transferrable through learning/ not duplicable ( any two points)  | 2 |
| 12 | Explain the process and product concept of science<br>( any two points)   | 2 |
| 13 | What are repeatability and reproducibility<br>Repeatability – general practice in science to repeat the experiments in order to duplicate the results.<br>Reproducibility : concordance between repeated measurements | 2 |
| 14 | What is the importance of chemistry in physics<br>Any two relevant points   | 2 |
| 15 | What is the main contribution of Antoine Lavoisier in science<br>Law of conservation of mass/ explanation for combustion/ classification of element as metals and non metals/ oxygen theory (any two).....            | 2 |
| 16 | What are softwares? How are they classified? Give examples.<br>Set of instructions / statements that are carried out by the CPU.<br>System software, application software.  | 2 |
| 17 | What arescientific method<br>Body of technique for investigating phenomena acquiring knowledge or correcting and integrating previous knowledge   | 2 |
| 18 | What is correlation coefficient?<br>Correlation coefficients are used in statistics to measure how strong a relationship is between two variables.  | 2 |

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| 19   | <p>What is meant by standard deviation (Definition or equation)</p> <p>The standard deviation is a statistic that measures the dispersion of a dataset relative to its mean.</p> <p>Standard Deviation=<math>\sqrt{\sum_{i=1}^n (xi - x)^2/n-1}</math></p> <p>where <math>xi</math> =Value of the <math>i</math>th point in the data set</p> <p><math>x</math>=The mean value of the data set,<math>n</math>=The number of data points in the data set</p> | 2      |
| 20   | <p>Explain the inductive method of scientific creativity</p> <p>Observations leading to a general conclusion.</p>  | 2      |
| 21   | <p>What is operating system of a computer</p> <p>Software consisting of programs and data which runs on computers and manages the computer hardware and provides common service for efficient execution of various application software</p>  | 2      |
| 22   | <p>Give names of any four journals in chemistry</p> <p>Name of any four journals</p>   | 2      |
| <p><b>Section C</b></p> <p><b>Answer any six questions, each question carries 4marks</b></p> |  |        |
| 23   | <p>What distinguishes hypothesis from theory? Explain</p> <p>Hypothesis : Intelligent guess – different forms with examples</p> <p>Theory – explanation with suitable examples</p>   | 2<br>2 |
| 24   | <p>Explain documentation of experiments.</p> <p>Documentation – preliminary section - body of the report - reference section- explanation of main sections with sub sections</p>   | 2<br>2 |
| 25   | <p>What are different branches of chemistry</p> <p>Explanation of any four branches</p>  | 4      |
| 26   | <p>Explain enquiry vs discovery approach</p> <p>Explanation with examples</p>  | 4      |
| 27   | <p>Distinguish copy right and patent</p>   | 2      |

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|    | Copy right – IPR provided by the government to authors of original work- literary-musical- computer programmes – other creative works -.....<br>Patent – right to any one who invents or discovers any new and useful process/ machine / product .....ownership of patent - procedure | 2      |
| 28 | Explain the terms citation and key words of a science journal<br>Explanation with example   | 4      |
| 29 | Write a note on contributions of John Dalton in science revolution<br>Contributions – atomic theory- explanation for laws of chemical combination - .....   | 4      |
| 30 | Explain the file formats MOL, SDF, CML and PDF<br>Explanation of the file format MOL -1, SDF -1, CML -1and PDF -1   | 4      |
| 31 | What are the various measures of toxicity of chemicals?<br>Explanation with examples  | 4      |
|    | <b>Section D</b><br><b>Answer any two questions, Each question carries 15marks</b>  |        |
| 32 | Explain the components essential for preparing a research article in chemistry<br>Title /Abstract of the work/ introduction/ review of literature/ materials and method design of the study/ results and discussion/ conclusion and suggestion / reference/ acknowledgement           | 15     |
| 33 | Explain the basics of chem. Informatics and their applications.<br>Basics of chem. Informatics – definition and need of chem. informatics<br>Applications   | 8<br>7 |
| 34 | (a) How data information and knowledge differ? Explain.<br>Knowledge – information – definition – differences between the two-<br>(b) Discuss the internal resources available for virtual learning.<br>Resources of virtual learning / importance                                    | 8<br>7 |
| 35 | What are the major contributions of   |        |

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|  | <p>a) Robert Boyle<br/>Boyles law/ coined the term element/new theoretical frame work for chemistry.....</p> <p>b) Dmitri Mendeleev<br/>Periodic law/ periodic table/ related points</p> <p>c) Michael Faraday<br/>Laws of electro chemistry/magnetic properties of matter/ colloidal materials/ heterogeneous catalysis/ .....</p> <p>d) Marie Skowlodwska Curie in Science<br/>Work on radio activity/ discovery of elements polonium and radium/ developed technique to isolate radium from pitchblende/ established standards measure of radio activity/ medical application of radium<br/><br/>(15 points)</p> | <p>3½</p> <p>4</p> <p>4</p> <p>3½</p> |
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